



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/775,075

02/11/2004

Kensaku Shinozaki

042100

3422

38834 7590 03/26/2007

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP
1250 CONNECTICUT AVENUE, NW
SUITE 700
WASHINGTON, DC 20036

EXAMINER

VAN, LUAN V

ART UNIT

PAPER NUMBER

1753

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
--	-----------	---------------

3 MONTHS

03/26/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/775,075

Applicant(s)

SHINOZAKI, KENSAKU

Examiner

Luan V. Van

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on February 8, 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 10 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Applicant's amendment of February 8, 2007 does not render the application allowable.

Status of Objections and Rejections

The rejection of claims 1-6 and 10-11 under 35 USC 112, first paragraph, is withdrawn in view of Applicant's amendment.

The rejection of claims 1-6 and 10-11 under 35 USC 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Fatcheric et al. is withdrawn in view of Applicant's amendment.

All other rejections from the previous office action are maintained.

The new grounds of rejection are necessitated by Applicant's amendment.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

Art Unit: 1753

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-2 and 4 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Wolski et al. '140.

Regarding claim 1, Wolski et al. '140 teach an electrodeposited copper foil wherein part of its surface comprises a rough surface having knob-like projections (or nodules, column 3 lines 18-22) and a surface roughness of 3.3 to 3.7 micrometer (on the matte side, see comparative example 1 in table 2 and table 3), which is within the range of the instant claim. In addition, the limitation "the copper foil is an untreated copper foil" is a process limitation, and thus is not given patentability weight, since the copper foil is distinguished by the surface roughness characteristic and not by whether it has been treated or untreated.

Art Unit: 1753

As described above, according to MPEP 2113, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

In addition, it would have been obvious to one having ordinary skill in the art to have recognized that the projections of Wolski et al. '140 are inherently intermittent, because the foil is made by the same method, i.e. electrodepositing (see Abstract), and has the same roughness as that of the instant claim.

Regarding claim 2, Wolski et al. '140 teach an electrodeposited copper foil wherein part of its surface comprises a rough surface having knob-like projections (or nodules, column 3 lines 18-22) and a surface roughness of 3.3 to 3.7 micrometer (on the matte side, see comparative example 1 in table 2 and table 3) is a surface of an untreated copper foil for bonding with a resin substrate and is further roughening treated by running a predetermined current (table 1) through the foil for a predetermined time in an electroforming bath. The electrolysis is inherently performed for a predetermined time.

Regarding claim 4, Wolski et al. '140 teach an electrodeposited copper foil wherein said rough surface is further formed with a copper plating layer (column 5 lines 30-35).

Claim Rejections - 35 USC § 103

Claims 1, 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wolski et al. '140 in view of Fatcheric et al. (assuming the projections are not inherently intermittent).

Wolski et al. '140 teach the copper foil as described above. The difference between the reference to Wolski et al. '140 and the instant claims is that the reference does not explicitly teach the projections are intermittent.

Fatcheric et al. teach roughening treating the copper foil by depositing a fine nodular metal deposit, such as copper or copper alloy, in order to improve the adhesion to a substrate (Abstract). The nodules on the copper foil as seen in Fig. 2 are broadly interpreted to be intermittent.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the foil of Wolski et al. '140 by forming the intermittent projections of Fatcheric et al., because it would improve the adhesion of the copper foil to a substrate. Furthermore, it would have been obvious to one having ordinary skill in the art to have expected that the foil of Wolski et al. '140 would have the intermittent projections of Fatcheric et al., because Wolski et al. '140 use the same process, i.e. depositing copper nodules on the foil, to treat the copper foil as that of Fatcheric et al.

Regarding claim 2, Wolski et al. '140 teach an electrodeposited copper foil wherein part of its surface comprises a rough surface having knob-like projections (or

Art Unit: 1753

nodules, column 3 lines 18-22) and a surface roughness of 3.3 to 3.7 micrometer (on the matte side, see comparative example 1 in table 2 and table 3) is a surface of an untreated copper foil for bonding with a resin substrate and is further roughening treated by running a predetermined current (table 1) through the foil for a predetermined time in an electroforming bath. The electrolysis is inherently performed for a predetermined time.

Regarding claim 4, Wolski et al. '140 teach an electrodeposited copper foil wherein said rough surface is further formed with a copper plating layer (column 5 lines 30-35).

Claims 3, 5, 6 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wolski et al. '140 in view of Fatcheric et al.

Wolski et al. '140 teach the copper foil as described above. The difference between the reference to Wolski et al. '140 and the instant claims is that the reference does not explicitly teach forming an additional nickel, zinc, cobalt layer or alloy thereof and a chromate layer.

Fatcheric et al. teach an electrodeposited copper foil, wherein said electroforming bath is an acidic electroforming bath containing nickel, cobalt, zinc or arsenic for depositing the respective metal or alloys thereof (column 5 lines 7-17). Additionally, Fatcheric et al. teach an electrodeposited copper foil wherein said rough surface is further formed with a copper plating layer and at least one layer of nickel plating, zinc plating, cobalt plating, plating of an alloy of the same (column 5 lines 13-20) and a

Art Unit: 1753

chromate treatment layer (column 5 lines 21-23) on that, or further formed with a coupling agent treatment layer (column 5 lines 21-24).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the foil of Wolski et al. '140 by depositing a zinc layer of Fatcheric et al., because the zinc layer provides a barrier layer between the copper foil and the laminating resin substrate in order to prevent laminate staining which occurs when ingredients of the resin chemically react with copper (column 4 lines 50-55). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have further modified the foil of Wolski et al. '140 by depositing a chromate layer of Fatcheric et al., because it would provide a protective layer for the underlying barrier layers (column 5 lines 21-22).

Response to Arguments

Applicant's arguments with respect to Fatcheric et al. are persuasive, thus the rejections using Fatcheric et al. as the primary reference have been withdrawn.

In the arguments presented on page 9 of the amendment, the applicant argues that Wolski et al. teach that the untreated copper foil has flatter surfaces on both surfaces as compared with conventional ones, and concludes that because the surfaces are "flatter", they would not have intermittent knob-like projections. This argument is deemed to be unpersuasive, because a "flat" or "flatter" surface is relative terminology, and even though a surface may be flat on a large length scale, it will still have projections at the microscopic level. Because the copper foil of Wolski et al. has the

Art Unit: 1753

same roughness as that of the instant claim, it would have been obvious to one having ordinary skill to have expected that the foil of Wolski et al. to have the same knob-like projections.

The applicant argues that in Wolski et al. the copper nodules are not part of the surface of the copper foil. This argument is deemed to be unpersuasive, because the copper nodules that are deposited on the copper foil become part of the copper foil, thus the copper foil with the copper nodules is the copper foil.

In response to the argument that the copper foil of Wolski has different and inferior physical properties compared to those of the instant invention, the arguments of counsel cannot take the place of evidence in the record. *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). Objective evidence which must be factually supported by an appropriate affidavit or declaration to be of probative value includes evidence of unexpected results, commercial success, solution of a long-felt need, inoperability of the prior art, invention before the date of the reference, and allegations that the author(s) of the prior art derived the disclosed subject matter from the applicant. See, for example, *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984). See MPEP 716.01(c).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP §

Art Unit: 1753

706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan V. Van whose telephone number is 571-272-8521. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1753

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LVV
March 20, 2007



NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700